THE UNIVERSITY OF ALABAMA IN HUNTSVILLE Acct. No: 5-33196

UAH8-38609 DO7

R&D

QUARTERLY TECHNICAL PROGRESS REPORT

Report No.: 4 (final)

FOR THE PERIOD OF: March 12, 1993 - January 12, 1994 Prepared: 1-13-94

Contract No.:	NAS8-38609	Delivery Order No.:	70

Delivery Order Title: *"Solid Rocket Motor Expert System"*

Research Activities Performed:

1.0 Knowledge acquistion for SRM design and analysis of results
2.0 Design model base
3.0 Design rule base
4.0 Code for the protptype
5.0 Demonstration of prototype development in November and December of 1993
6.0 Final demonstration January 19, 1994

See appended document for additional detail. The longer report has been transmitted to Melissa VanDyke (Propulsion Laboratory, MSFC).

Problems Encountered:

None

Research Activities Planned Next Mon...

None

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Prepared for:
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TPR/RA88 Attachments may be appended

Summary of extended report

The purpose of this research is acquire and analyze the knowledge of solid rocket motor design and develop a prototype-demonstration knowledge-based system (KBS) tailored to the new engineer (0-5 years). In particular the system is to:

1. serve as an aid to SRM design and development,
2. give advice concerning SRM design changes, and
3. assist in the training of new SRM personnel.

The working prototype is has been delivered after two demonstrations and reviews. A final demonstration and report was given on January 19, 1993.

The SRM expert system is intended to be a tool that aids in the design of solid rocket motors (SRMs). Although there is software that can be used as an aid in the design of solid rocket motors, the focus of our system on the design process with attention to the needs of the new engineer is novel. The SRM expert system is designed to aid the engineer with less than six years of experience in the design of large solid rocket motors, arbitrarily defined as a SRM over forty inches in diameter that is a candidate for launch systems. This definition excludes upper stage motors such as IUS, TOS, or third stage Peacekeeper and will specifically include motors such as Castor, RSRM, ASRM, and possibly other motors. The expert system will enhance the capabilities of the target engineer primarily in two ways: first, by assisting when design changes are contemplated for an established design; and second, by assisting in SRM design and development. By the very nature of this system and the performance of these two primary functions, the system will be a valuable tool for training new personnel.